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INFLUENCE OF CULTIVATION CONDITIONS AND YEAST STRAIN ON THE CONTENT OF MANNAN POLYSACCHARIDE IN CELLS

Keywords: Mannan polysaccharides, S. cerevisiae yeast, biological properties, cell wall, physiological activity.

Mannan is a polysaccharide widely distributed in nature, which consists of mannose residues linked by β (1–4) bonds [1]. It is obtained from various sources, such as plants, bacteria, fungi, and yeast [2]. The mannan polysaccharide has attractive biological properties, which has expanded its application in many sectors, especially in the field of nutrition and medicine [3].

Recently, there is an increasing focus on yeast cell wall as a source of mannan since it is a cheap by-product that is produced in large amounts in breweries [4].

The mannan content in yeast cells varies depending on many factors, including the physiological state of the yeast, the yeast strain, and the cultivation conditions. In this context, this research aimed to investigate the influence of cultivation conditions and the role of the yeast strains on the content of mannan in yeast cells [5].

Two strains of *S. cerevisiae* were used in this study, which cultivated using two cultivation methods. The mannan content was determined at different stages of yeast growth. According to the obtained results, the highest mannan content was found in

yeast *S. cerevisiae Belgian Wit* M21, which grew in the batch culture (on the medium prepared from barley wort extract) at a temperature of 28 ℃ after 9 hours of cultivation, where its content increased by 98.98 %. Whereas it's content in the cells that were grown in the batch culture at 24 ℃ and the cells which were grown on Petri plates at temperature 28 ℃ was maximum after 15 hours of cultivation. Its content increased by 99.85 % and 90.69 %, respectively.

In yeast *S. cerevisiae Californian Lager* M54, which was grown in the batch culture at a temperature of 28 ℃, the highest amount of mannan in the cells was after 9 hours, where its content increased by 57.61 %. In contrast, the highest amount of mannan in the cells that were grown on Petri plates at temperature 28 ℃ was after 15 hours of cultivation, and its content increased by 32.47 % in the cells.

According to the obtained results, we conclude that the mannan content in yeast cells varies depending on the yeast strain and cultivation conditions. In addition, mannan accumulation was associated with the physiological state of the yeast, where there was a distinct increase in yeast cells that had a good physiological state.

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